

PREVENTING PICC AND MIDLINE OCCLUSIONS WITH THE CLC2000™



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Introduction

MVI HomeCare, located in Girard, Ohio, is a multifaceted agency providing infusion therapy, Medicare home care, and hospice services. The company employs approximately 50 clinical staff members and has an average daily census of about 120 patients. MVI performs, on average, three PICCs and two midline insertion procedures per week. The patient population includes a large number of orthopedic cases (for physical therapy and incision care, plus some antibiotic therapy) and wound care cases (for antibiotic therapy). Other patients usually require therapy for congestive heart failure and COPD (chronic obstructive pulmonary disease). This paper outlines our goals to reduce costs and enhance patient care by preventing catheter occlusions through the use of the CLC2000™.

Background

MVI was interested in finding ways to reduce the cost of treating infusion patients while simultaneously improving the quality of patient care and level of comfort. We were using the Interlink® IV Access System,* a two-piece device, and experiencing PICC and midline occlusions. This system created a negative displacement upon needle withdrawal from the additive port when medications and/or flush fluids were introduced to the catheter. This negative displacement drew up blood into the indwelling catheter lumen and often led to

occluded catheters, adding cost and a great deal of patient discomfort and inconvenience.

In our quest for continuous improvement in a cost-governed environment, we identified three major issues:

- 1) Preventing PICC and midline occlusions
- 2) Decreasing supply costs
- 3) Improving the quality of patient care and comfort delivered

Two alternatives

MVI considered two available products that could successfully address all three of our primary issues: the PASV™ valve, a two-part device from Catheter Innovations, and the CLC2000† from Abbott Laboratories. The CLC2000 is a one-piece, swabbable valve that eliminates retrograde blood flow and creates positive displacement upon syringe disconnection.

MVI decided to conduct a trial using both products. This would allow the staff to state their preferences and would provide actual patient feedback on both. Heparin would not be used with either device.

The trial

In-service sessions were conducted on both devices at team meetings in January and February 2000. A roll-out target date of February 14 was chosen as the start of the test period. The PASV device was to be assessed for one week, followed by a one-week evaluation of

*The Interlink IV Access System is a registered trademark of Baxter Healthcare Corporation, Deerfield, IL 60015.

†The CLC2000 is distributed by Abbott Laboratories under license from ICU Medical Inc., San Clemente, CA 92673-6212.

the CLC2000. Then the testing cycle would be repeated with each test period extended to two weeks. Of course, problems with either device could — and did — change the trial schedule. Four teams were involved, divided by regions. Each team included five full-time and part-time nurses, for a total of 20 nurses.

An evaluation form was developed to track the total number of catheters monitored and the number of catheter occlusions. Incidents were also tracked on vascular access device logs to generate Quality Improvement/Performance Improvement data.

Due to a lack of new patient starts, the initial PASV device assessment was extended to include a second week. In week 3, and for the remainder of the trial (ending on March 31), the CLC2000 was used. After one week, the staff began to use the CLC2000 from preference because there was so much positive feedback from patients on the ease of use and ease of access to the device due to the T shape.

At first, only PICCs and midlines were changed over to the CLC2000. Implanted ports and triple lumens were initially excluded because replacement, if necessary, would be more costly and difficult than replacing a PICC or midline. As everyone became more comfortable with the concept of “positive pressure,” all vascular access devices were included in the trial.

As of the beginning of March, nearly all patients had been switched to the CLC2000 regardless of the type of access device — PICCs, midlines, implanted ports, TLCs, and Hickman's (excluding any Groshong catheters).

Feedback

Learning to use the CLC2000 device was very easy. A one-hour in-service session was sufficient. Initially there was a short adjustment period, as the nurses became accustomed to working with a new device and a new technique without heparin. Nurses reported it was easy to teach patients how to flush the CLC2000. Both nurses and patients also liked that the CLC2000 was a swabbable valve and offered needlestick protection. All in all, it was a very smooth transition.

The results

None of the occlusion problems that occurred during the study could be attributed to the CLC2000.

Comparison of Occlusion Rates

	Fourth Quarter 1999 (with Interlink)	March 1- May 31, 2000 (with CLC2000)
Number of Occlusions	5	3*
Total Catheters Monitored	43	64
Average Occlusion Rate	12%	5%*

*Not attributable to the CLC2000.

Occlusion Rate

In fourth quarter 1999, the clotting rate was approximately 12%. After conversion to the CLC2000 we experienced a 5% occlusion rate, although occlusions were not directly attributable to the device itself. Three confirmed occlusions were reported. These incidences involved continuous drug infusion through the CLC2000 adapter. We did not feel these occlusions could be attributed to the CLC2000 because its benefits as a positive pressure device never would have been utilized. Furthermore, two of these three incidents occurred with the same patient who earlier had been diagnosed with a clotting problem. The other patient had been instructed to flush daily (versus every other day with the bag change) and had no further problem with his next line.

Cost savings

Both patients and nurses are extremely satisfied with the switch to the CLC2000. The total cost of care dropped. In general terms, if we can avoid replacing one PICC line by preventing an occlusion, we can save the cost of at least three nursing visits, plus the cost of the PICC kit itself, the sterile clothing the nurses need to wear, personal protective equipment, sterile drapes and gloves, and any required trips to Radiology. The total cost is approximately \$500 to \$700 per PICC restart. Midline replacement costs are comparable. During the trial period alone, MVI saved about \$3500 in PICC and midline procedures because the CLC2000 device prevented occlusions.

Avoiding central line restarts adds another \$3000 per year in savings. Combined PICC, midline, and central line insertion annual cost savings are \$6500. All of these are in addition to the \$8000 savings generated by the elimination of heparin, the flush syringe, and labor involved in drawing and flushing the line. These total cost savings will approach \$14,500 per year, attributable directly to the use of the CLC2000 device.

Conclusion

Changes in the healthcare market will continue to bring new challenges. In my opinion, the CLC2000 from Abbott Laboratories prevents catheter occlusions, eliminates the need for heparin flushes, provides considerable cost savings, and increases the quality of patient care. In fact, savings in materials, nursing labor, and fewer midline and PICC restarts more than cover the annual cost of the CLC2000 for all MVI patients.